



## **Systems Engineering & Supportability Conference**

# ***Affordable Readiness & Reduced Total Life Cycle Cost through Integrated Life Cycle Support (ILCS)***

**Presented By  
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- ◆ UDLP
- ◆ Background
- ◆ Partnership
- ◆ Partnership Objectives
- ◆ Partnership Vision
- ◆ Integration is the Key
- ◆ ILCS Model
- ◆ ILCS Products and Services
- ◆ ILCS Business Solutions
- ◆ ILCS Customer Model
- ◆ O&S Challenges
- ◆ ILCS Implementation- SCOR
- ◆ ILCS Applied to Crusader
- ◆ Success Factors – Metrics
- ◆ Summary

## United Defense Headquartered in Arlington, VA



**Ground Systems Division**



**Steel Products Division**



**Marine Corp  
Systems Division**



**Defense Systems International Division**



**Armament Systems Division**



# U.S. Locations



TEAM  
CRUSADER

Armament  
Systems  
Division



Aberdeen, SD



Minneapolis, MN

Ground  
Systems  
Division



York, PA

Ground Systems Division



San Jose, CA

Port Hueneme, CA

National City, CA

Warren, MI

Fayette County, PA

Eatontown, NJ

Arlington, VA

Norfolk, VA

Quantico, VA

Dahlgren, VA

Lawton, OK

Pascagoula, MS

Albany, GA

Ground Systems Division  
Aiken, SC

Mayport, FL

Orlando, FL



Armament Systems Division  
Louisville, KY



Steel Products Division  
Anniston, AL

- ◆ Manufacturing Facility
- ★ Defense Systems International Division
- ▲ United Defense Regional Office
- Engineering/Service Facility (ASD)

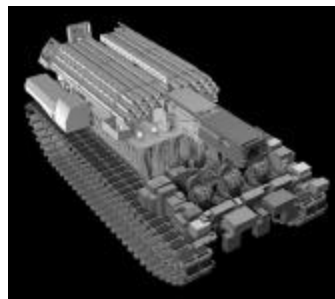
## CRUSADER 155mm Field Artillery System Program

**Team Leader,  
Prime Contractor,  
System Integrator**

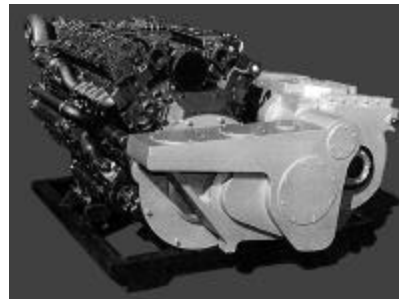
- ◆ XM2001 Self-Propelled Howitzer (SPH)
- ◆ XM2002 Ammunition Resupply Vehicle (RSV)
- ◆ Fully Automated Ammo Handling
- ◆ Advanced, Liquid-Cooled Cannon
- ◆ Fully Digitized Crew Cockpit
- ◆ Advanced Survivability
- ◆ Embedded Performance Support System



XM2001 SPH



XM2002 RSV



Power Pack



Crew Cockpit



Armament/  
Ammunition Handling

## Environment

- ◆ Defense Budgets
  - ◆ Constant or Increasing O&S Costs
  - ◆ Continuing Modernization Requirements
- ◆ Declining Force Structure
- ◆ Increasingly Complex Systems



## Support Initiatives

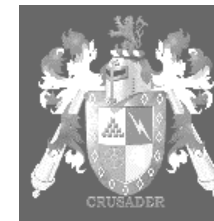
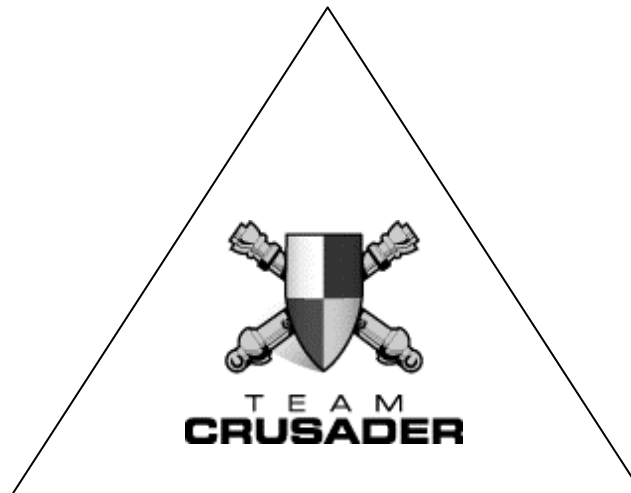
- ◆ Revolution in Military Logistics
- ◆ Revolution in Business Affairs
- ◆ FY98 Authorization Act, Section 912.c: Streamline acquisition organizations, workforce, and infrastructure
  - ◆ “Product Support for the 21<sup>st</sup> Century”
- ◆ FY99 Authorization Act, Section 816.c:
  - ◆ 30 DoD pilot programs for product support responsibility by the Program Manager throughout the entire life cycle
- ◆ “An Acquisition Concept for ‘Cradle to Grave’ Partnerships with Industry



**TSM-Cannon  
(User)**

United Defense

**Industry  
(OEM)**



**OPM Crusader  
(Material Developer)**

## Concurrent Engineering - Design for Supportability

Today contractors are taking on broader responsibility

- Entire supply chain
- Configuration management
- Maintenance above operational level





- ◆ Improve War Fighter Support
  - ◆ Improved Readiness
  - ◆ Improved Availability
  - ◆ Reduced Logistics Response Time = Reduced Customer Wait Time
  - ◆ Asset visibility and tracking system
- ◆ Reduce Life Cycle Cost - Generate Savings
- ◆ Reduce Force Structure Commitment to Support
  - ◆ Reduce logistics burden on Warfighter
  - ◆ Reduce logistics footprint

**United Defense Response -  
Life Cycle Commitment in Partnership with Government**

# Partnership Vision



An Integrated Life Cycle Support (ILCS) capability characterized by:

- ◆ Integrated Government and Industry Team
- ◆ Focused Responsibility and Authority
- ◆ Continuous Fleet Performance Assessment
- ◆ Support Process Improvement
- ◆ Total Ownership Cost Reduction (TOCR)
- ◆ Improved Operational Readiness

**An integrated lifecycle management perspective will inherently change the business practices and organization associated with system development, production, and sustainment**

# Integration is the Key

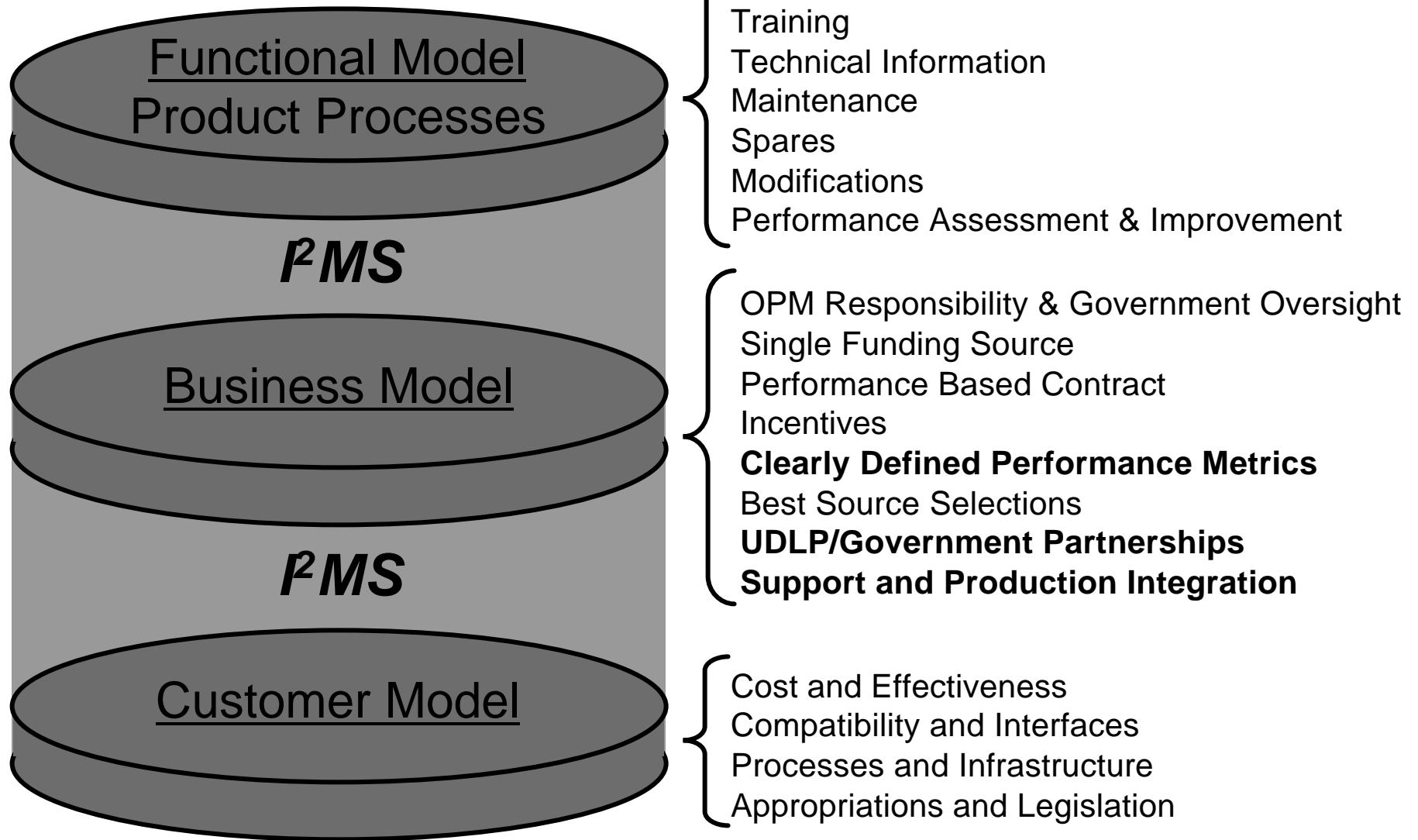


## ILCS is the integration of:

- ◆ **Government and industry** to adopt the “**Best Source**” for sustainment products and services
  - ◆ User driven, OPM led, OEM executed - Government oversight maintained
  - ◆ Capitalize on multiple potential Best Sources, government and industry, including **Partnerships with Government Depots**
- ◆ **Development, production, fielding, and support** activities to realize life cycle cost reductions and/or improved performance
  - ◆ Modernization Through Spares
  - ◆ Technology Insertion
  - ◆ Obsolescence Protection
  - ◆ Reduction in Total Ownership costs
- ◆ **Cross functional logistics elements** to provide optimal sustainment solutions

The ILCS team is enabled by *information* and *flexibility* resulting in rapid, cost effective response to problems and opportunities.

# ILCS Model





- ◆ Technical Assistance
- ◆ Training: Augment U.S. Army Training Activities
- ◆ Technical Information: Procedures, Data, Drawings
- ◆ Maintenance
  - ◆ Repair of Reparables
  - ◆ Heavy Maintenance & Overhaul
- ◆ Spares: Forecasting, Inventory Management, and Distribution
- ◆ Modifications
- ◆ Performance Assessment & Improvement

**ILCS Products and Services are developed in partnership with the Customer and Suppliers**



- ◆ Technical Assistance
  - ◆ Local and Central Assistance
  - ◆ Fielding
  - ◆ Configuration (Concurrency) Management: System, Training, Spares, SE
- ◆ Training: Augment U.S. Army Training Activities
- ◆ Technical Information: Procedures, Data, Drawings
- ◆ Maintenance
  - ◆ Crew, Unit, and DS On-Vehicle Maintenance Remain Organic
  - ◆ Repair of Reparables
  - ◆ Heavy Maintenance and Overhaul
- ◆ Spares: Demand Forecasting, Inventory Management, and Distribution
- ◆ Modifications
  - ◆ Modernization Through Spares, Obsolescence Protection, Technology Insertion
- ◆ Performance Assessment and Improvement
  - ◆ Weapon System Performance
  - ◆ ILCS Product & Services Performance
  - ◆ Problem and Opportunity Identification; Investment and Funding Requirements

- ◆ Army Activities
- ◆ ILCS - UDLP: Synergy and Focus Essential to Realizing Objectives
- ◆ ILCS - Best Source Analysis will Identify Sources

- ◆ Respond to Customer Needs and Stakeholder Issues
- ◆ Employ and Enable Best Practices
- ◆ Accommodate all Potential Industry/Government Relationships

## Best Practices

- ◆ OPM Responsibility & Government Oversight
- ◆ Single Funding Source
- ◆ Performance Based Contract
- ◆ Incentives
- ◆ Clearly Defined Cost and Performance Metrics
- ◆ Best Source Selections
- ◆ United Defense/Government Partnerships
- ◆ Support and Production Integration

**Become**



## Enablers

- ◆ Focused Authority, Responsibility, and Accountability
- ◆ Rapid Response to Problems or Opportunities
- ◆ Flexibility
- ◆ Long Term Strategic Partnership
  - ◆ Development/Production/Support Synergy
- ◆ Competition
- ◆ Visibility into Support Cost and Performance

- ◆ Cost and Effectiveness (Flexibility)
  - ◆ Cost Visibility Driving Improvement
  - ◆ Cost Visibility Driving Cost Control
- ◆ Compatibility and Interfaces
  - ◆ Two Level Maintenance -Soldiers  
Replace Forward/Repair Rear
  - ◆ GCSS-A and I<sup>2</sup>MS Interface
- ◆ Processes and Infrastructure
  - ◆ Manage the Supplier, not the Supplies
  - ◆ Insight and Oversight
- ◆ Appropriations and Legislation
  - ◆ Program Integration: Development, Production, Fielding, Support
  - ◆ Single Funding Source



Reduce Burden on the Warfighter



**Obsolescence**

**Asset Visibility**

**Forecasting**

**Army  
Working  
Capital Fund**

**System Life-Cycle  
(40 years??)**

**Customer  
Wait Time**

**Spectrum of DoD  
Operations**

**Modernization/  
Technology  
Insertion**

**Long Term Commitments**

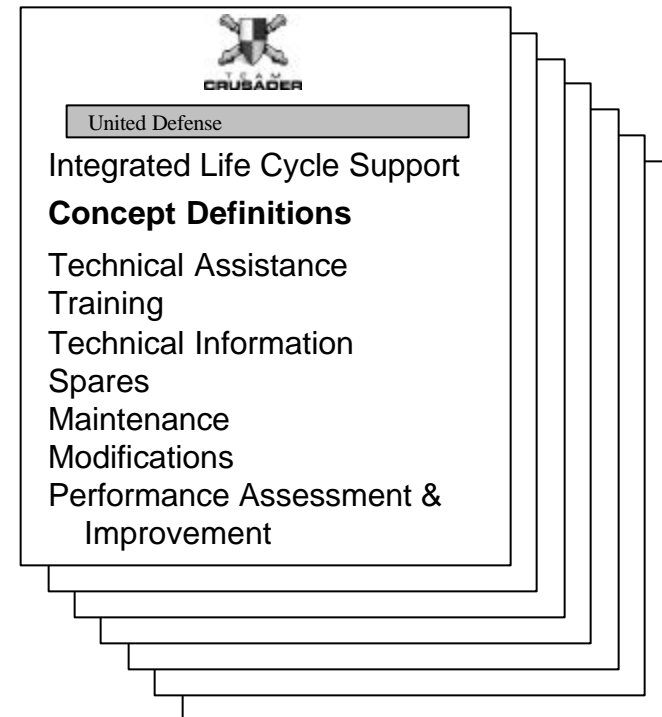
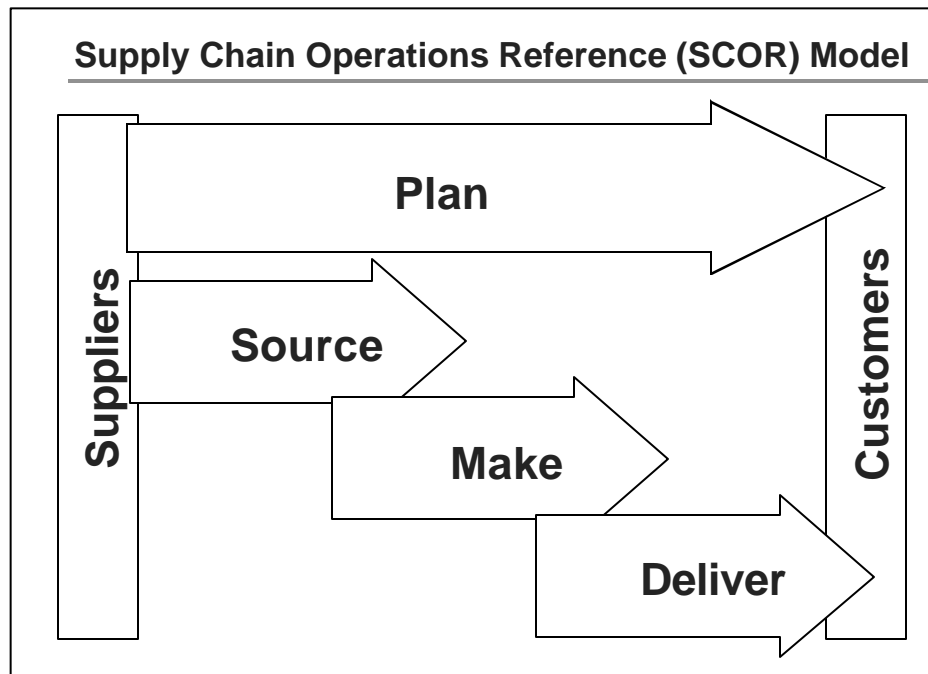
Motivate Industry Investment

Time to build relationships

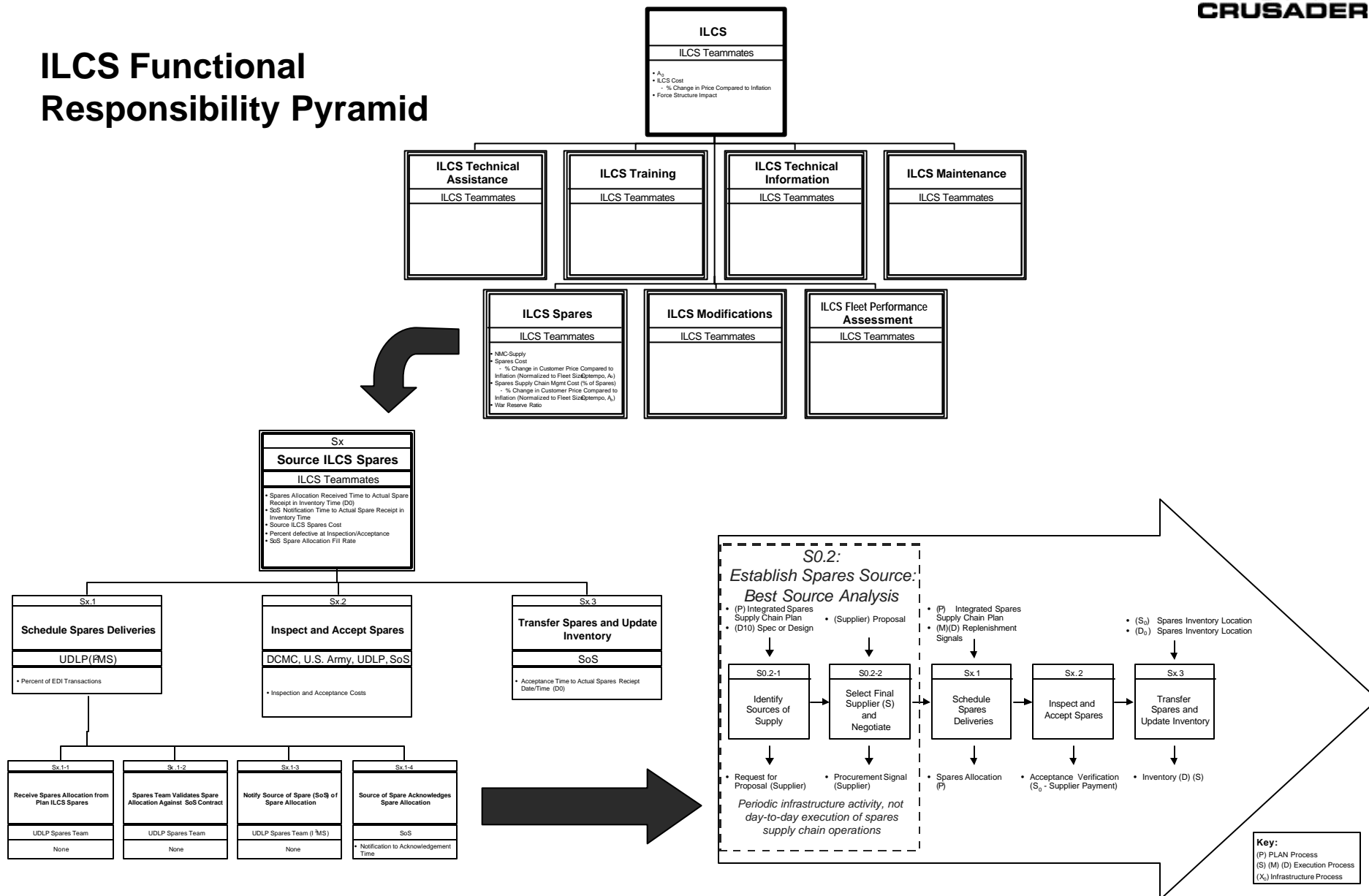


**Supply Chain**

- ◆ Recognized Approach: SCOR
- ◆ Process Ownership
- ◆ Process Metrics
- ◆ Process Best Practices
- ◆ Infrastructure Requirements
- ◆ Business Considerations
- ◆ Integral Performance Assessment



## ILCS Functional Responsibility Pyramid



# Success Factor: Metrics



Measure factors under contractor control

Understand incentives associated with metrics

Relate as directly as possible to Warfighter concerns

<b>Process Category Name:</b> Deliver ILCS Spares		<b>Process Number:</b> D <sub>s</sub>	
<b>Process Category Definition</b>			
Stocked: The process of delivering products, which are maintained in a finished goods state prior to the receipt of a firm customer order.			
Make-to-Order: The process of delivering product which is manufactured, assembled or configured after the receipt and validation of a firm customer order.			
<b>Responsibility</b>		ILCS Teammates	
<b>Performance Attributes</b>		<b>Metric</b>	
Cycle Time		Customer Wait Time	
		Fault ID to User Receipt of Spare Time	
		GCSS-A Entry to User Receipt of Spare Time	
		GCSS-A Entry to Delivery Time	
		Order Receipt to Delivery Time	
Cost		Delivery Cost per Order	
Service/Quality		Perfect Order Fulfillment	
		Fill Rate	
		Delivery Performance	
		Actual Delivery to Scheduled Delivery	
		Actual Delivery to Estimated Delivery	
Assets		None	
<b>Best Practices</b>		<b>Software Features Required</b>	
Rapid replenishment, Vendor Managed Inventory, EDI		None Identified	
Electronic Catalogues/Malls		None Identified	
Internet Ordering		None Identified	
<b>Efficient Consumer Response (ECR);</b> Quick Response		Demand Planning, Deployment, Scheduling	



- ◆ ILCS is the Primary Crusader Support Concept
  - ◆ 912(c) Implementation Plan
- ◆ OPM led ILCS Assessment Underway
  - ◆ Process Verification - Are ILCS processes viable and compatible?
  - ◆ Business Model - Are business relationships achievable?
  - ◆ Cost Effectiveness Evaluation - Will savings be realized?
- ◆ ILCS Model is Responsive
  - ◆ Continuous Improvement Focus
  - ◆ Best Source Foundation
- ◆ Cohesive Government and Industry Partnership

**Meet DoD Objectives for Product Support for the 21st Century**



- ♦ Integrated Life Cycle Support Meets the Challenges of the 21st Century Defense Environment
- ♦ Aggressive Supply Chain Management Fuels the “Success Spiral”
- ♦ United Defense is Committed to Common Objectives of Team Crusader

**Improve Warfighter Support  
Reduce Life Cycle Cost - Generate Savings  
Reduce Force Structure Commitment to Support**